Undergraduate Degree Program Catalogue | 2023-2024 |
دليل البرنامج الدراسي

Al-Furat Al-Awsat Technical University

Bachelor of Science Honours (B.Sc. Honours) –
Techniques of Avionics Engineering Department
بكالوريوس علوم – هندسةتقنيات الكترونيات الطيران

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1. Mission & Vision Statement

Vision Statement

The vision of the Techniques of Avionics Engineering department at Engineering Technical College-Najaf is to contribute to society by producing highly competent and dedicated engineering technicians in the field of electronics engineering in general, and aviation electronics in particular, with a high level of efficiency and ethical responsibility.

Through comprehensive and specialized training, the graduate engineering technicians are capable of designing and developing complex electronic systems used in the aviation industry. They acquire advanced technical skills in analysis, maintenance, testing, and integration of electronic systems in aircraft.

The vision promotes professional ethics, dedication to work, and enhances the social responsibility of engineering technicians, fostering trust and respect within the community and contributing to progress and advancement in the field of electronics engineering and aviation electronics.

As graduates of the Department of Avionics Electronics Engineering, they have the ability to shoulder responsibility in high-tech work environments and strive for innovation and continuous development in the field.

Mission Statement

The mission of the Techniques of Avionics Engineering department at Engineering Technical College-Najaf is as follows:

- To serve our students by teaching them problem-solving skills and finding appropriate solutions, bridging the gap between theory and practice, developing leadership and teamwork skills, instilling values of commitment and ethical behavior, and fostering respect for others.
- To produce technically proficient graduates with a high level of academic achievement and broad practical skills in the field of specialization.
- To provide innovative technology for the benefit of the local and global community in the field of specialization.
- To conduct cutting-edge research to solve problems and improve the performance of electronic and electrical systems and control systems in aviation.
- To collaborate with civil and military organizations to market the skills in the field of specialization.
- To provide advice and guidance for obtaining civil aviation licenses and airworthiness training licenses from the European Aviation Safety Agency, as well as licenses related to ground support.

2. Program Specification

Program code:		**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

The Techniques of Avionics Engineering department offers a comprehensive curriculum that prepares students for a rewarding career in the dynamic field of aviation technology. The program encompasses a wide range of subjects at all levels, providing students with a strong foundation in both theoretical knowledge and practical skills. The curriculum is designed to meet the demands of the rapidly evolving aviation industry, ensuring graduates are well-equipped to excel in their chosen careers.

Throughout the program, students will engage with modules that cover various essential topics. These modules include:

English for Academic Purposes: This module focuses on developing students' English language proficiency, enabling effective communication and comprehension in academic settings.

Computer Principles: Students will gain a fundamental understanding of computer systems, including hardware, software, and programming concepts relevant to aviation electronics.

Calculus (Differentiation and Application): This module introduces students to calculus, emphasizing differentiation and its applications in solving engineering problems.

DC Electrical Circuits: Students will study direct current (DC) electrical circuits, including circuit analysis techniques, network theorems, and circuit components relevant to aviation electronics.

Physics: This module provides a foundation in classical physics principles, covering topics such as mechanics, thermodynamics, and electromagnetism.

Engineering Drawing: Students will develop skills in technical drawing and visualization techniques essential for interpreting and creating engineering designs and schematics.

As students progress through the program, they will delve deeper into advanced topics, including electronic circuits, digital logic, electromagnetic fields, thermodynamics, and engineering mechanics. They will also explore specialized subjects such as aircraft stability, signals and systems, avionics systems, and digital communications.

The curriculum further includes modules on integrated circuit design using FPGA technology, power electronics, fundamental networking, control engineering, and research methodology. Additionally, students will develop essential skills in areas such as communication, teamwork, and management engineering.

In their final year, students will undertake a comprehensive research project, allowing them to apply their knowledge and skills to real-world aviation electronics challenges. This final project serves as an opportunity for students to demonstrate their proficiency and showcase their ability to contribute to the advancement of the field.

The Techniques of Avionics Engineering department program combines theoretical instruction, practical training, and research-oriented projects to provide students with a well-rounded education. Graduates will be prepared to pursue a variety of career paths within the aviation industry, including avionics engineering, aircraft maintenance, research and development, and more.

3. Program Goals

Due to the rapid scientific and technological advancements in the field of aviation, the Avionics Engineering department at Engineering Technical College-Najaf is working towards achieving clear strategic objectives that will help it establish a prominent position within academic communities. These objectives are evident in the following:

1. Preserving and improving the quality of the curriculum through:

- Incorporating scientifically and internationally updated study materials in the field of aviation electronics technology, and keeping up with rapid scientific advancements.

- Establishing direct communication with decision-makers in aircraft engineering worldwide and direct contact with colleges and specialized institutes in aviation technology.
- Continuous evaluation and development of the curriculum.
- Connecting student projects and research with the needs of the community.
- Expanding students' awareness through field visits to domestic airports, study tours, and training at airport runways and maintenance workshops.

2. Establishing state-of-the-art scientific laboratories and equipping them with the latest devices and technical equipment in the field of specialization, managed by a team of skilled technicians.
3. Providing the best academic environment for the faculty members.
4. Ensuring the technical development of the faculty members through:

- Encouraging active participation in conferences and technical meetings, particularly with Iraqi and international airport administrations and global training companies.
- Continuous review and evaluation of their activities.
- Encouraging faculty initiatives and achievements.

5. Knowledge production through:

- Conducting distinguished theoretical and applied research.
- Promoting scientific publications and encouraging collaborative work among research groups in various specializations.
- Striving to increase research funding sources through publications in international engineering journals.

6. Initiatives to reduce administrative routines and facilitate work procedures through educational guidance and enhancing the relationship between students and instructors.
7. Activating and strengthening connections with public government entities and the private sector through:

- Organizing conferences, seminars, and educational courses.

- Encouraging consultancy work and providing professional services in various engineering disciplines.

4. Student Learning Outcomes

1. The Department of Avionics Electronics Engineering focuses on the study and application of electronic systems in the aviation industry. Students in this department learn about the design, development, and maintenance of complex electronic systems used in aircraft.
2. The curriculum of the Avionics Electronics Engineering department is designed to provide students with a strong foundation in electronics and aviation-specific knowledge. They study subjects such as computer principles, DC and AC electrical circuits, digital logic circuits, electromagnetic field, thermodynamics, and engineering mechanics.
3. The department offers a Bachelor of Science degree in Avionics Electronics Engineering, which equips students with the skills and knowledge required to excel in the field. Students have the opportunity to specialize in areas such as electronic circuit design, aircraft stability, signals and systems, communication skills, avionics systems, and digital signal processing.
4. Through a combination of theoretical learning and practical training, students develop the necessary technical skills to analyze, maintain, and integrate electronic systems in aircraft. They also gain a strong understanding of safety regulations, a sense of ethical responsibility, and a dedication to excellence in their work.
5. Upon graduation, students from the Department of Avionics Electronics Engineering are prepared to enter the workforce as highly skilled engineering technicians. They are equipped to contribute to the development and advancement of electronic systems in the aviation industry, ensuring the safety and efficiency of aircraft operations.
6. In addition, the department supports interdisciplinary collaboration and offers courses that benefit students from other departments. This fosters a holistic

7. understanding of aviation electronics and promotes knowledge sharing across different fields.
8. Overall, the Department of Avionics Electronics Engineering is committed to producing competent and responsible engineering technicians who can meet the demands of the rapidly evolving aviation industry.

5. Academic Staff

Academic staff of the department

	Name	Certificate			Mobile Number	
1	Ali Mohammed Saeed	M.Sc.	Asst. Professor in Communications Eng.		+9647801426897	
2	Dhurgham Abdulridha Jawad Al-Khaffaf	M.Sc.	Asst. Professor in Communications Eng.			
3	Marwa Jalil	Ph.D.	Asst. Professor in Communications Eng.			
4	Abdallah Ali Jaber	Ph.D.	Lecturer in Communications Eng.			
5	Qusay Jalil	M.Sc.	Lecturer in Communications Eng.			
6	Heyam Obaid	M.Sc.	Lecturer in Electronic Eng.			
7	Ali Kahdim Obaid	M.Sc.	Lecturer in Electronic Eng.			
8	Mustafa Taher	M.Sc.	Asst. Lecturer in Communications Eng.			
9	Ruaa Shalal	M.Sc.	Lecturer in Communications Eng.			
10	Assra Khadum	M.Sc.	Asst. Lecturer in Communications Eng.			
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6. Credits, Grading and GPA

Credits

ATU is following the Bologna Process with the European Credit Transfer System (ECTS) credit system.

The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Calculation of the Grade Point Average (GPA)

1. The GPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   GPA of a 4-year B.Sc. degrees:

   GPA = [(1st module score x ECTS) + (2nd module score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU14011	English for Acadimic U.	18	32	2.00	S	NO
ATU14012	Computer Principals	63	37	4.00	B	NO
ATU14013	Calculas (Differentiation and Application)	63	62	5.00	B	NO
ATU14014	DC Electrical Circuits	93	82	7.00	C	NO
ATU14015	Physics	93	82	7.00	C	NO
ATU14016	Engineering Drawing	63	62	5.00	S	NO
Total		393	357	30		

Semester 2 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU14021	Human Right and Democracy	18	32	2.00	S	NO
ATU14022	Calculas (Integration and Applications)	63	62	5.00	B	NO
ATU14023	AC Electrical Circuits	63	62	5.00	C	NO
ATU14024	Fundemantls of Electronics	93	82	7.00	C	NO
ATU14025	Digital Logic Circuit	138	62	8.00	C	NO
ATU14026	Engineering Workshops	48	27	3.00	B	
Total		423	327	30		

Semester 3 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU14031	Electronic Circuite	78	72	6.00	C	No
ATU14032	Digital Circuits and Applications	63	62	5.00	C	No
ATU14033	Series, Sequence and Differential Equations	63	62	5.00	B	No
ATU14034	Electromagnetic Field	48	52	4.00	C	No
ATU14035	Thermodynamic	63	62	5.00	B	No
ATU14036	Engineering Mechanics	63	62	5.00	C	No

Total		378	372	30		

Semester 4 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU14041	Electronic Circuite Design	63	62	5.00	S	No
ATU14042	Multivaribles Mathmatics	63	62	5.00	B	No
ATU14043	Probability and Randam Process	63	62	5.00	B	No
ATU14044	Theroy of Flight	63	62	5.00	C	No
ATU14045	Matlab Programming	48	52	4.00	B	No
ATU14046	Strength of Materials	93	57	6.00	B	
		393	357	30		

Semester 5 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU14051	Aircraft Stability	78	72	6.00	C	NO
ATU14052	Signals and System	63	62	5.00	B	NO
ATU14053	Advance Engineering Analysis	63	62	5.00	B	NO

ATU14054	Communication Skills	18	32	2.00	C	NO
ATU14055	Analog Communications	63	62	5.00	B	NO
ATU14056	MICROPROCESSOR	93	82	7.00	C	
Total		378	372	30		

Semester 6 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU14061	ANTENNA AND WAVE PROPAPGATION	63	37	5.00	B	NO
ATU14062	Control Engineering	78	122	6.00	B	NO
ATU14063	Numerical Analysis	63	87	5.00	B	NO
ATU14064	Python Programing	48	52	4.00	C	NO
ATU14065	Digital Communications	63	37	5.00	C	NO
ATU14066	DIGITAL SIGNAL PROCESSING	63	37	5.00	C	
		378	372	30		

Semester 7 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU14071	Power electronics	93	82	7.00	C	NO
ATU14072	Avionics System	93	82	7.00	C	NO
ATU14073	Fundamental Networking	63	62	5.00	C	NO
ATU14074	Integrated circuit design using FPGA technique	63	62	5.00	C	NO
ATU14075	Management Engineering	33	42	3.00	S	NO
ATU14076	Research Methodology	33	42	3.00	S	NO
Total		378	372	30		

Semester 8 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU14081	Aeronautical legislation & Human Factors	33	42	3.00	C	NO
ATU14082	Radar and Microwave	108	92	8.00	C	NO
ATU14083	System Design using FPGA Technique	63	62	5.00	C	NO
ATU14084	Networking Protocol	63	62	5.00	C	NO
ATU14085	Final Project	123	102	9.00	C	NO

Total		390	360	30		

Total for all Semesters		3111	2889	240.0		

8. Contact

Program Manager:

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ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي